

In the Claims:

This listing of claims replaces all prior versions.

1. (Previously presented) Method for manufacturing a floating gate type semiconductor device on a substrate having a surface, the method comprising:

forming, on the substrate surface, a stack comprising an insulating film, a first layer of floating gate material and a layer of sacrificial material,

forming at least one isolation zone through the stack and into the substrate, the first layer of floating gate material thereby having a top surface and side walls,

removing the sacrificial material, thus leaving a cavity defined by the isolation zones and the top surface of the first layer of floating gate material, and

completely filling the cavity with a second layer of floating gate material, the first layer of floating gate material and the second layer of floating gate material thus forming together a floating-gate.

2. (Previously presented) Method according to claim 1, furthermore comprising, after filling the cavity, partially removing the isolation zones so as to expose part of the side walls of the floating gate.

3. (Previously presented) Method according to claim 2, the second layer of floating gate material having side walls, wherein the isolation zones are removed so as to completely expose the side walls of the second layer of floating gate material and part of the side walls of the first layer of floating gate material.

4. (Previously presented) Method according to claim 1, furthermore comprising the step of forming a control gate and an interlayer dielectric between the floating gate and the control gate.

5. (Previously presented) Method according to claim 1, furthermore comprising the step of forming a protection layer between the first layer of floating gate material and the sacrificial layer.

6. (Previously presented) Method according to claim 1, wherein the sacrificial material is any of a nitride layer, an oxide layer or a silicon carbide layer.

7. (Previously presented) Method according to claim 1, further comprising, after filling the cavity, removing floating gate material present outside the cavity.

8. (Previously presented) Method according to claim 1, wherein the first layer of floating gate material and the second layer of floating gate material are the same material.

9. (Previously presented) A floating gate type semiconductor device, comprising:

a substrate having a surface,

a stack of layers on the surface comprising an insulating film, a first layer of floating gate material having a top surface, and

a second layer of separately deposited floating gate material on said first layer of floating gate material that completely covers the top surface of the first layer, the first and second layers forming together a floating-gate.

10. (Previously presented) A non-volatile memory including the semiconductor device according to claim 9.

11. (Previously presented) Method for manufacturing a floating gate type semiconductor device on a substrate having a surface, the method comprising:

forming, on the substrate surface, a stack comprising an insulating film, a first layer of floating gate material and a layer of sacrificial material,

forming at least one isolation zone through the stack and into the substrate, the first layer of floating gate material thereby having a top surface and side walls,

removing the sacrificial material, thus leaving a cavity defined by the isolation zones and the top surface of the first layer of floating gate material,

filling the cavity with a second layer of floating gate material having sidewalls, the first layer of floating gate material and the second layer of floating gate material thus forming together a floating-gate, and

partially removing the isolation zones so as to completely expose the side walls of the second layer of floating gate material and to partially expose the side walls of the first layer of floating gate material.

12. (Previously presented) Method according to claim 11, further comprising forming a control gate and an interlayer dielectric between the floating gate and the control gate.

13. (Previously presented) Method according to claim 11, further comprising forming a protection layer between the first layer of floating gate material and the sacrificial layer.

14. (Previously presented) Method according to claim 11, wherein the sacrificial material is any of a nitride layer, an oxide layer or a silicon carbide layer.

15. (Previously presented) Method according to claim 11, further comprising, after filling the cavity, removing floating gate material present outside the cavity.

16. (Previously presented) Method according to claim 11, wherein the first layer of floating gate material and the second layer of floating gate material are the same material.